EPA CASAC Particulate Matter Review Panel
Remarks by Wig Zamore on Friday, February 3, 2006
On Behalf of Two All Volunteer Local Community Groups in Massachusetts
Mystic View Task Force (MVTF) and Somerville Transportation Equity Partnership (STEP)

Dr. Rogene Henderson and Distinguished Members of the Committee,

Thank you for the opportunity to briefly bring the concerns of two local community groups from Somerville, Massachusetts to the critically important question of national particulate matter standards. MVTF and STEP focus on land use, transportation, air quality and public health. I want to urge you to do two things today. The first is to lower the annual average fine particle standard to 12 μg/m3 and the second is to bring real and rapid EPA resources to more effective control of near source mobile pollution and the very serious health effects that result from the overlay of dense local populations and intense regional transportation corridors and nodes. These exposures are a problem in most US cities.

Somerville lies just northwest of Boston and due north of Cambridge, although most of our community is in a different local air shed from our neighbor to the south. We have been the densest city in Massachusetts for over a century, with roughly 20,000 people per square mile now. We have about 7000 immigrants per square mile and 5000 people who live in carless households. Our community contributes very little to regional air pollution on a per capita basis but breathes in more commuter generated emissions per capita than any other city in the state. We are the only community in Massachusetts with over 200,000 vehicle miles traveled per day per square mile and we are the only community with 15,000 diesel trains per year per square mile. The major commuting corridor through Somerville, with an interstate highway and two busy arterials, carries 250,000 vehicles per day to and from Boston. Less than 10% of the people on the highways and trains which pass through live or work here. Our modeled mobile pollutants from general surface transportation are the highest in the region.

From 1996 through 2000, Somerville had more heart attack and lung cancer deaths, in excess of the Massachusetts age-adjusted mortality rates, than any of Massachusetts' other 351 municipalities. We had 145 such excess deaths in just 4 square miles over those 5 years. Our age-adjusted mortality rates for those two ICD categories exceeded the state's by 36%. (More recently, I have quickly examined the 15 years of local Massachusetts public health data now available from the Department of Public Health. For the years 1989 through 2003, the disparities are somewhat smaller for Somerville, and the other cities located along mobile corridors which had large heart attack and lung cancer disparities from 1996 through 2000. In general the years 1995 through 1999 show the greatest disparities, up and down from state averages, while the earlier years show the least and the latest years are intermediate. From 1989 through 2003 Somerville shows 291 excess deaths in the two ICD 9/10 categories and a 23% excess mortality rate.) Some health indicators here are much better. Somerville citizens smoke less than the state average but I am unable to offer details with regards to other confounders. Our population, like that of Cambridge and Brookline, is quite mobile. If more citizens lived here for more of their lives the acute myocardial infarction and lung cancer deaths would likely be higher. In short, our health outcomes are very close to what one would expect from recent near source studies. Any reasonable able-minded person ought to consider these numbers alarming.

With regard to the annual average fine PM standard, I would point out that Abt Associates health effects study for EPA shows 390 annual deaths within the Boston region for acute effects of fine PM and 594 deaths annually projected for chronic exposure. There are 2.4 million adults in Suffolk, Middlesex and Norfolk Counties. Abt's chronic effects projections are based on conservative "between region and city" cohort studies and only reflect the gap in the Boston region between 12.1 μg/m3 and 7.5 μg/m3. Our regional design standard here is 14.4 μg/m3 and the natural background is assumed to 3.5 μg/m3, a gap that is roughly twice as large as that used for the Abt projections. All in all, the PM criteria documents do not seem to give evidence that there is a safe threshold anywhere above 7.5 μg/m3, even though data points are thinner as the levels decrease. **Therefore I urge you to recommend 12 μg/m3 as the highest annual average standard that is reasonable for protecting health.**

I would like to briefly mention the "geographic scale of influence" patterns that are evident both within the major cohort studies that you have relied upon and within the more recent near source mobile health effects studies. As one moves from consideration of Pope's ACS cohort studies of 1995 and

2002 – that are based upon large metropolitan areas - to the Willis ACS county level re-analysis of sulfates - to the Harvard Six Cities studies of 1993 and 2006 that are city based, the association of mortality, sulfates and fine PM goes up as the scale of investigation goes down. Thus, the more accurate the association of monitors and population exposure, the greater the effects recognized.

As one then proceeds to consider the within city quintiles of Nyberg's Stockholm lung cancer study - based upon NO2 gradients - and Jerrett's more recent Los Angeles ACS local study – the association of traffic pollutants and premature mortality grows even higher. At the smallest scales yet studied, Hoek and Brunekreef's near roadway study of cardiopulmonary mortality in the Netherlands and Finkelstein and Jerrett's similar near roadway study of cardiovascular mortality in Hamilton Ontario find even higher associations of mobile pollution and premature death than the big cohort studies. Studies of near roadway morbidity have found similarly dramatic near source gradients. I would especially note the Gauderman studies in Southern California on lung capacity and childhood asthma near highways, as well as a recent German study that found increased risk of COPD in women near heavily traveled roadways. Finally, I would point out that Frederica Perera's sophisticated studies of infant cancer and health risk in NYC, and Knox's simpler English studies of mobile risk factors, birth addresses and childhood cancer each bear further review as well as follow-up investigation.

I think that it is worth considering a few historic reference points as you decide what to recommend to EPA regarding the new PM standards under consideration today. Since Lave and Seskin's seminal 1970 article on air pollution and human health, the association of sulfates, particulates and mortality has been known. Lave and Seskin themselves recognized the likely harm from mobile sources in 1977 but believed that controlling them might be very much less cost effective than controlling sulfates from power generation. In the aftermath of the Clean Air Act of 1970, the 4 volume Report on Mobile Emissions of the NAS Coordinating Committee to the Senate Public Works Committee looked hard at the issues of regional versus local exposures and risks. They decided that concentration of urban populations was a bad idea, notwithstanding the decrease in regional vehicle miles, because of increases in the percent of population exposed to dangerous primary pollutants including PM. Boston and Los Angeles were the two cities modeled for this national investigation nearly a generation ago.

The Coordinating Committee also seriously discussed a national "two car" standard because of their insight into the trade-offs between exposure and cost effective protection of human health. Ultimately, they decided that the technological expectations for mobile source improvement were so large that policies attuned to urban pollution gradients and varying intensities of health effect were unnecessary. The expected 90% drop in mobile pollutants between 1971 and 1976 emanated from the technology forcing ideas of Senators Muskie and Baker as much as from the aspirations of a young EPA staff. In Somerville at that same time, studies preceding the construction of I93 projected very high Lead exposures, very high CO exposures and very high PM exposures. Although these anticipated highway exposures far exceeded any reasonable health standards, the concerns were rationalized away based on lack of proven connection between lead in the air and children's neurological development, as well as the very ambitious 90% pollution reductions expected from catalysts and other vehicular technology.

The local air improvements predicted in the 1970s did not come to pass at the levels anticipated. We easily may have had 500 excess heart attack and lung cancer deaths here since the completion of I93.

As we look around today there are many arenas of environmental, transportation and land use policy that should be providing mitigation for these serious health issues and preventing any exacerbation, but few are. The Mobile Source Air Toxic arena has been a huge disappointment, in part because the 1996 NATA assumptions for highway emissions are off by 100 – two orders of magnitude – due to equal weighting of all roadway miles, with cul-de-sacs and interstates treated the same. NATA 1999 will be a little better, but not much. Zoning laws here do not protect the health and welfare of renters, who have no standing in Massachusetts and many other states, even though renters are a majority of our local population. Transportation conformity analyses are supposed to identify underlying and systemic health disparities but really only look at significant new projects and at regional (rather than local) emissions inventories in states which have ozone violations but are in attainment for PM.

You really are our best hope for stricter new standards and for attention to near source health effects.

Regards, Wig Zamore